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Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

Sub-Committee of Experts on the Transport of Dangerous Goods
Forty-fifth session
Geneva, 23 June – 2 July 2014
Item 11 (g) of the provisional agenda
Issues relating to the Globally Harmonized System of Classification and Labelling of Chemicals: corrosivity criteria

Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals
Twenty-seventh session
Geneva, 2 – 4 July 2014
Item 3 (c) of the provisional agenda
Classification criteria and hazard communication: Work of the TDG-GHS working group on corrosivity criteria

Update on the work of the intersessional informal joint working group on corrosivity criteria

Transmitted by the expert of the Netherlands on behalf of the intersessional joint TDG-GHS working group on corrosivity criteria[1]

Introduction

1. During the twenty-sixth session of the Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), the expert from the United Kingdom transmitted the outcome of the Joint Working Group on Corrosivity in informal document INF.27. The Joint Group confirmed the correlation between the GHS sub-categories 1A, 1B and 1C with Packing Groups I, II and III respectively where these are based on human, animal or *in vitro* data. The challenge was in assigning packing groups in the transport sector when the GHS alternative methods, particularly the additivity and non-additivity approaches, were applied. A further challenge lay in identifying additional criteria for when Packing Group I should be assigned for substances and mixtures classified as GHS sub-category 1A and not included in the Dangerous Goods List.

[1] In accordance with the programme of work of the Sub-Committee for 2013–2014 approved by the Committee at its twenty-sixth session (see ST/SG/AC.10/C.3/84, para. 86 and ST/SG/AC.10/40, para. 14).

2. The Sub-Committee agreed to continue working on the development of a proposal on the basis of the outline presented in paragraph 8 of GHS informal document INF.27. It also agreed to request the TDG Sub-Committee to consider mechanisms to address the issue outlined in the first row of the table, i.e. developing a mechanism to assign substances to packing group I for transport purposes on the basis of considerations that could go beyond hazard classification.

3. The expert of the Netherlands offered to lead the development of the proposal, working with other experts in an intersessional informal joint working group.

4. Experts from the United States of America, Australia, United Kingdom, Germany, Belgium, Netherlands, CEFIC, RPMASA and the European Commission met twice in a teleconference (30 January, 27 February) and an extended group of experts received the correspondence regarding the work of the intersessional informal joint working group. The minutes of these teleconferences can be found in informal document INF.3.

5. This working paper presents a brief summary of the working group discussion and a proposed approach to assign packing groups in the transport sector as developed in the intersessional informal joint working group. To enhance the understanding of the background of the following proposal the reader is referred to informal document INF.3. A proposal for a revised Chapter 2.8 based on the approach presented in this working paper will be submitted as an informal document before the forty-fifth session of the Sub-Committee (TDG) and the twenty-seventh session of the Sub-Committee (GHS).

6. Outside the scope of the teleconferences were discussions on revisions of named entries on the Dangerous Goods List (DGL) as any revisions to named entries on the Dangerous Goods List should follow already established procedures. At this stage in the process, there is no intention to change the named entries on the DGL. Also outside the scope of the discussion were issues associated with the implementation of GHS into supply and use legislation in the European Union (such as translation of classifications done under the European Directives 67/548/EEC and 1999/45/EC to classifications under Regulation 1272/2008) as this is a topic for discussions on global classification lists.

Summary of discussion

7. The intersessional informal working group based its discussions on the proposal in paragraph 8 from informal document INF.27 (GHS, 27th session), taking into account the conclusions from the previous discussions.

GHS hazard class	Transport		Additional criteria and considerations	Transport conditions
1A	8A	Other criteria*	PG I based on "other criteria" PG II	Special packing provisions, limited and excepted quantities and downstream transport provisions
1B	8B		PG II	
1C	8C		PG III	
1**	8		PG II	

* *Other criteria: In case the GHS hazard category is Cat.1A, the results of the individual in vivo/in vitro studies, human evidence and/or experience, may warrant the use of Packing Group I for transport. The criteria are not necessarily hazard based.*

** *Where due to limited hazard information on the transported substance/mixture, the GHS criteria do not allow the assignment of the subcategory.*

8 The group agreed on a set of conditions that the solutions should fulfil. These include no change in the level of safety for transport, the transport conditions will not become more severe, there will be no change in the classification and PG assignments of substances listed by name on the Dangerous Goods List due to this change in criteria, the hazard classification criteria for skin corrosive are consistent between GHS and transport sectors, and the solution should not promote the use of tests conducted on animals.

9. The group agreed to base the solution on elements from the existing system instead of developing a new rationalized approach for assigning packing groups. This latter approach would require extensive amount of time and information, and finding a new rationale that encompassed the current rationale for packing group assignment for both named entries and NOS entries would be quite difficult due to the risk-based case-by-case approach used for assigning packing groups to named entries.

10. The classification GHS Skin Corr 1A can be obtained using OECD 404, OECD 435, OECD 431, bridging principles, assimilation/QSAR/Read-across and the additivity approach. However the group acknowledged that sub-classification into 1A based on these methods will not be possible in all cases.

11 It was concluded that in cases where the hazard classification GHS Skin Corr 1A is based on in vivo testing, in vitro testing such as OECD 435 and OECD 431 or the bridging principles, no additional criteria are needed for assignment of packing group I. It was recognized that different testmethods described under OECD 431 differ in their predictivity for classification into GHS Skin Corr 1A.

12. However, when GHS Skin Corr 1A is the result of the application of the additivity method for mixtures, additional criteria are necessary to discriminate between PG I and PGII as the additivity method is conservative compared to classification based on test results. The group agreed that in this case, a proposal from CEFIC to assign packing group to the mixture based on the packing group of the ingredients of the mixture would be a good starting point for further work.

13. A diagram outlining the proposal from CEFIC is included in the Annex to this paper. This approach includes using the specific threshold values (X_1) associated with the proper shipping name on the Dangerous Goods List to calculate whether a mixture is assigned to packing group I, II or III. If no specific threshold is associated with the proper shipping name, then a generic threshold limit (X_2) will be used. A numerical value for this generic threshold limit was not determined by the intersessional working group.

14. This method requires further work before a conclusion can be reached by the Sub-Committee (TDG). In particular further work is needed to determine the numerical value of the generic threshold limit in order to achieve a sufficient safety margin while maintaining the current ratio in packing group assignments.

15. The group acknowledged that cases are possible where GHS criteria do not allow classification in a subcategory. Examples are cases where only a pH-value, results from in vitro tests using OECD 430 or the non-additivity approach, or when very little information is available. However, for transport, it is still necessary to assign a packing group to these materials.

16. The group agreed that in those cases, a default packing group would be assigned. The default packing group could be either PG I or PG II. However there was no consensus in the intersessional joint working group on which packing group would be most appropriate as the default. In either case, provisions for assigning lower or higher packing

groups could be considered based on available information. The group concluded that more work was needed before a decision by the Sub-Committee (TDG) could be made on the most appropriate default packing group assignment, and when the default packing group could be varied.

Questions

17. The Sub-Committees (TDG) and (GHS) are invited to consider the following modification of the proposal for transport to take account of GHS criteria in the classification of substances and mixtures not listed by name:

GHS hazard classification	**Transport class**	**Packing group**	**Transport conditions**
1A based on OECD 404 OECD 435 OECD 431 Bridging principles	8A	PG I	Special packing provisions, limited and excepted quantities and downstream transport provisions
1A based on additivity	8A	[PG I, II or III based on "threshold limits"]	
1B	8B	PG II	
1C	8C	PG III	
1	8	[PG I] [PG II]	

***NOTE**: The table outlines a general approach for a possible solution. Further discussions are needed on how to incorporate this framework, including which terminology is to be used, into a proposal for a text for a new chapter 2.8 in the Model Regulations.*

18. Do Sub-Committees TDG and GHS agree with the general approach presented (i.e. should the work on this approach continue)?

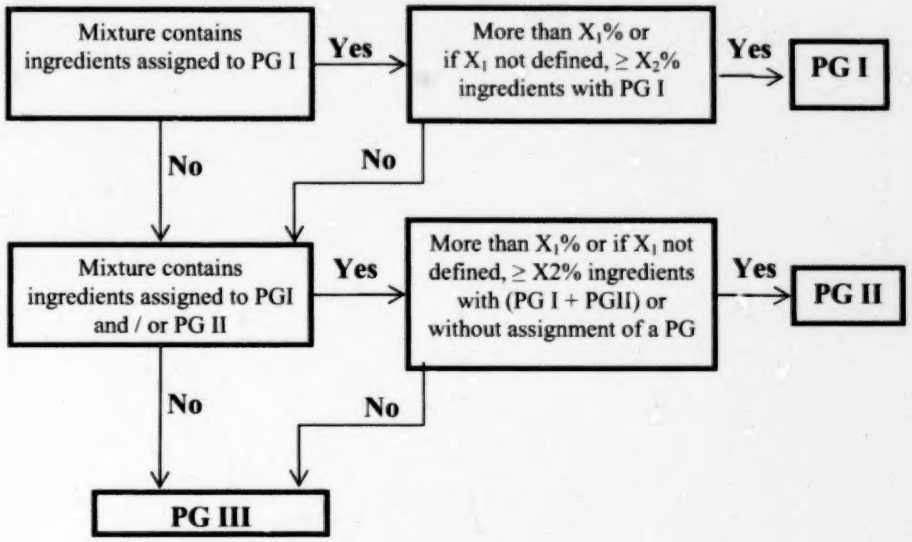
19. Do Sub-Committees TDG and GHS agree that the final two issues to resolve are within the mandate of the UN SCE TDG?

20. Does the Sub-Committee TDG agree to elaborate the diagram included in Annex I?

21. When the available data do not allow GHS sub-classification, is the preference of the Sub-Committee TDG for PG I or PG II?

Annex I

Diagram as presented by CEFIC in the intersessional informal joint working group


Mixture contains ingredients assigned to PG I
Yes
More than X_1% or if X_1 not defined, ≥ X_2% ingredients with PG I
Yes
PG I
No
No
Mixture contains ingredients assigned to PGI and / or PG II
Yes
More than X_1% or if X_1 not defined, ≥ X2% ingredients with (PG I + PGII) or without assignment of a PG
Yes
PG II
No
No
PG III

Explanation of X:

X_1 = specific concentration limits as listed in or determined according the United Nations Model Regulations

X_2 = general concentration limit (e.g. 80 - 50 %), in case no SCL listed in the United Nations Model Regulations

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Sub-Committee of Experts on the Transport of Dangerous Goods

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Geneva, 23 June – 02 July 2014
Item 7 (f) of the provisional agenda
Miscellaneous proposals for amendments to the Model Regulations on the Transport of Dangerous Goods: marking and labelling

Marking of inner receptacles of composite IBCs

Transmitted by the International Confederation of Plastics Packaging Manufacturers (ICPP)[1]

Background

1. At the forty-fourth session of the Sub-Committee, the marking of the date of manufacture of plastics inner receptacles of composite IBCs was discussed in detail on the basis of ICPP informal document INF 58.

2. The discussion showed that:

- The wording in para. 6.5.2.2.4 does not underline the necessity of a marking on inner receptacles of composite IBCs, including the date of manufacture of the inner receptacle;
- A reference should be made to the fact that the date of manufacture of the inner receptacle may be different to the date of manufacture of the completed composite IBC, placed on the plate on the outer casing;
- As result of repair or remanufacture the date of manufacture of the inner receptacle and the marked date of repair or remanufacture are in most cases different.

[1] In accordance with the programme of work of the Sub-Committee for 2013-2014 approved by the Committee at its sixth session (refer to ST/SG/AC.10/C.3/84, para. 86 and ST/SG/AC.10/40, para. 14).

3. In the report of the session (ST/SG/AC.10/C.3/88) the results of the discussion are summarized as follows:

> *122. The Sub-Committee noted that the amendment to 6.5.2.2.4 adopted during the last biennium on the basis of an oral proposal (ST/SG/AC.10/C.3/84, para.49) and concerning the marking of the date of manufacture caused problems for the industry in the case of composite IBCs.*
>
> *123. There was no consensus on the proposed deletion of the new sentence. However, given the date shown on the inner receptacle may differ from the date on the outer casing, it was agreed, as an interim solution, to delete the word "primary" from the sentence as a correction (see ST/SG/AC.10/1/Rev.18/Corr.2). The representative of ICPP will prepare a new proposal of amendment to 6.5.2.2.4 for the next session in order to address the issue of marking of composite IBCs.*

4. ICPP proposes to

- Underline the need of marking of the inner receptacle of composite IBC's (the inner receptacle has to correspond to the inner receptacle of a successfully tested design type);
- Add a further note in 6.5.2.2.4 that the date of manufacture of the inner receptacle may be different from the marked date of manufacture, repair or remanufacture of the completed IBC;
- Simplify the text of the first sentence by transforming the beginning of the provision in an additional note in line with the used wording in the note of 6.5.2.2.2.

Proposal (new text in bold)

5. Rephrase the first sentence of 6.5.2.2.4 to read as follows:

> **"Inner receptacles that are of composite IBC design type shall be identified by the application of** the markings indicated in 6.5.2.1.1 (b), (c), (d) where this date is that of the manufacture of the plastics inner receptacle, (e) and (f)."

6. Indicate the present "Note" as **"Note 1"**

7. Add a second note as follows:

> "***NOTE 2:*** *The date of manufacture of the inner receptacle may be different from the marked date of manufacture (see 6.5.2.1), repair (see 6.5.4.5.3) or remanufacture (see 6.5.2.4) of the composite IBC.".*

8. Add a third note as follows:

> "***NOTE 3:*** *The provisions in 6.5.2.2.4 shall apply to all composite IBC's manufactured, repaired, or remanufactured as from 1 January 2011.".*

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Sub-Committee of Experts on the Transport of Dangerous Goods

Forty-fifth session
Geneva, 23 June- 2 July 2014
Item 6 (b) of the provisional agenda
Transport of gases: miscellaneous

Insertion of new ISO standards for filling in P200

Transmitted by the International Organisation for Standardisation (ISO)[1]

Introduction

1. ISO TC 58/SC4 has published several standards on covering inspection at the time of filling. Industry representatives believe these standards are a positive contribution to the safety of pressure receptacles and would like to see these standards included in the United Nations Model Regulations.

2. The standards are:

ISO 10691:2004 Gas cylinders – Refillable welded steel cylinders for liquified petroleum gas (LPG) – Procedures for checking before, during and after filling

ISO 11372:2011 Gas cylinders – Acetylene cylinders – Filling conditions and filling inspection

ISO 11755:2005 Gas cylinders – Cylinder bundles for compressed and liquefied gases (excluding acetylene) – Inspection at time of filling

ISO 13088:2011 Gas cylinders – Acetylene cylinder bundles – Filling conditions and filling inspection

[1] In accordance with the programme of work of the Sub-Committee for 2013–2014 approved by the Committee at its twenty-sixth session (see ST/SG/AC.10/C.3/84, para. 86 and ST/SG/AC.10/40, para. 14).

ISO 24431:2006 Gas cylinders – Cylinders for compressed and liquefied gases (excluding acetylene) – Inspection at time of filling.

3. P200 seems the most appropriate place for these standards since that gives the instructions for filling. The basic requirements are that filling should be carried out by trained and qualified staff using appropriate equipment and procedures. These requirements would be considered to be fulfilled if the above listed standards were applied.

Proposal

4. Insert a new paragraph (4) in 4.1.4.1 P200 and renumber the existing paragraph (4) as (5), as follows:

(4) The filling of pressure receptacles shall be carried out by qualified staff using appropriate equipment and procedures.

The procedures should include checks of:

- The conformity to regulations of receptacles and accessories;
- Their compatibility with the product to be carried;
- The absence of damage which might affect safety;
- Compliance with the degree or pressure of filling, as appropriate;
- Markings and identification.

These requirements are considered to be fulfilled if the following standards are applied:

ISO 10691: 2004	Gas cylinders – Refillable welded steel cylinders for liquified petroleum gas (LPG) – Procedures for checking before, during and after filling.
ISO 11372: 2011	Gas cylinders – Acetylene cylinders – Filling conditions and filling inspection
ISO 11755: 2005	Gas cylinders – Cylinder bundles for compressed and liquefied gases (excluding acetylene) – Inspection at time of filling
ISO 13088: 2011	Gas cylinders – Acetylene cylinder bundles – Filling conditions and filling inspection
ISO 24431:2006	Gas cylinders – Cylinders for compressed and liquefied gases (excluding acetylene) – Inspection at time of filling

5. Since the standards are not mandatory, no transition provisions are necessary.

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Item 6 (b) of the provisional agenda
Transport of gases: miscellaneous

Insertion of new and replacement ISO standards in 6.2.2

Transmitted by the International Organisation for Standardisation (ISO)[1]

Introduction

1. This paper proposes the following standards for inclusion in section 6.2.2 concerning UN pressure receptacles. These are:

ISO 11515:2013 *Gas cylinders – Refillable composite reinforced tubes of water capacity between 450 L and 3000 L – Design, construction and testing* and

ISO 10462:2013 *Gas cylinders – Acetylene cylinders – Periodic inspection and maintenance.*

The latter standard replaces the 2005 version.

2. At the forty-fourth session, the experts agreed to include composite construction as a method of construction for tubes and the ISO 11119 series of standards were included for tubes of up to 450 litres water capacity. ISO 11515:2013 covers the remaining water capacity range of 450 litres to 3000 litres.

3. The significant technical changes in ISO 10462:2013 are as follows:

(a) The external visual inspection has been revised;

[1] In accordance with the programme of work of the Sub-Committee for 2013-2014 approved by the Committee at its sixth session (refer to ST/SG/AC.10/C.3/84, para. 86 and ST/SG/AC.10/40, para. 14).

(b) The inspection of monolithic porous materials with regard to cracking, crumbling or cavitation is given in greater detail for better clarity. A new Annex C for the determination of the top clearance between the porous material and the cylinder has been added;

(c) Requirements for the removal and inspection of the cylinder valve have been removed but are given in other standards as normative references.

Since this standard replaces a previous edition, it is subject to the four year transition period as specified in the Guiding Principles for the 18th Revised Edition.

4. Clause 4.1 of ISO 10462 includes the following.

"However, for acetylene cylinders that are newly filled with porous material, it is recommended to carry out the first periodic inspection earlier. This first periodic inspection interval is recommended as follows:

(a) Non-monolithic porous material: two years;

(b) Monolithic porous material: three years."

Non-monolithic porous material is not allowed in the UN Model Regulations, so can be ignored. The reason for the early periodic inspection is that faults in the porous material appear in the early part of its life due to the shock loads in normal handling opening up discontinuities. Since this early test is a safety recommendation, it seems prudent to include this in the regulations so that all benefit from a harmonized safety practice. Proposal 3 suggests a way of including this requirement in P200.

Proposal 1

5. Insert a new last row in the table in 6.2.2.1.2 as shown below.

ISO 11515: 2013	Gas cylinders – Refillable composite reinforced tubes of water capacity between 450 L and 3000 L – Design, construction and testing	Until further notice

Proposal 2

6. In the table in 6.2.2.4 amend the row for ISO 10462:2005 and insert a new row beneath it as shown by new text in bold.

ISO 10462: 2005	Transportable cylinders for dissolved acetylene – Periodic inspection and maintenance.	Until ~~further notice~~ **31 December 2018**
ISO 10462: 2013	**Gas cylinders – Acetylene cylinders – Periodic inspection and maintenance.**	**Until further notice**

Proposal 3

7. In P200 (4) special packing provision "p"add the following new paragraph at the end.

"For UN 1001 acetylene, dissolved and UN 3374 acetylene, solvent free the first periodic inspection shall be no later than three years after the porous material was installed in the cylinder."

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Transport of gases: miscellaneous

Hydraulic pressure testing of pressure receptacles

Transmitted by the International Organisation for Standardisation (ISO), the European Cylinder Makers Association (ECMA) and the European Industrial Gases Association (EIGA)[1]

Introduction

1. The text of 6.2.1.5.1 (g) concerns the hydraulic pressure test during the initial inspection and test of pressure receptacles. It reads:

> "A hydraulic pressure test. Pressure receptacles shall withstand the test pressure without expansion greater than that allowed in the design specification."

The phrase "design specification" does not have a defined meaning and is not used elsewhere in the Model Regulations so its meaning is open to question. Also, the words "expansion greater than that allowed …" can be understood to mean that a measurement of expansion is necessary. Since a working group containing several people also involved in developing the ISO standards for gas cylinders proposed this text, it can be confidently stated that this was not the working group's intention. ISO standards allow a choice of the type of hydraulic pressure test since they are both valid. This paper proposes to remove these weaknesses by replacing the above second sentence with more accurate text.

[1] In accordance with the programme of work of the Sub-Committee for 2013-2014 approved by the Committee at its sixth session (refer to ST/SG/AC.10/C.3/84, para. 86 and ST/SG/AC.10/40, para. 14).

2. Until 2013, the requirement for the hydraulic pressure test of non-UN pressure receptacles in ADR was:

> "A hydraulic pressure test. Pressure receptacles shall withstand the test pressure without undergoing permanent deformation or exhibiting cracks."

In the 2013 edition, in the interests of global harmonization this text was dropped and the requirement became harmonized with the UN Model Regulations text shown in paragraph 1. It can be inferred from the previous ADR text that the universal practice in Europe was to carry out the proof pressure test which consists of holding the pressure receptacle at test pressure while inspecting visually to detect deformation, cracking and leaks. On the other hand, the usual practice in North America and elsewhere, to use the volumetric expansion test in which the pressure receptacle is immersed in water and measurement of the water displaced during the pressure test allows the permanent expansion to be measured. There are some designs of gas cylinders for which this style of test is beneficial, but the ISO standards listed in the Model Regulations do not necessarily require the use of this test. The ISO standards allow either test to be used because both are acceptable methods of testing and the choice is given to allow the available equipment to be used.

3. Unfortunately, the adoption of this UN text in Europe has lead to confusion by some inspection bodies as to the intention of the change in the regulation and lead to the false conclusion that the volumetric expansion test is required in all cases. The first weakness in the text is the phrase "design specification". Discussion with those involved in the development of this text confirmed that design specification was meant to convey 'the design and construction technical standard' referred to in 6.2.1.1.3 and 6.2.1.2.2 or in the absence of such a standard the "technical code" referred to in 6.2.3.1. Looking at the use of "specification" in the requirements of Chapter 6.2 it only occurs in 6.2.1.4.1 under "Approval of pressure receptacles. "The technical documentation shall include full specifications on design and construction, and full documentation on the manufacturing and testing". This use of the word "specification" appears to lead to the conclusion that a defined permissible expansion should be part of the type specification, so it is necessary to establish the expansion as part of the type approval process and hence require the volumetric expansion test in the initial inspection and test. Whatever the merits of the above argument, it is certain that removal of doubt as to the meaning of "design specification" is very desirable in the quest for clear regulations. Therefore we propose to replace "design specification" by "design and construction technical standard or technical code".

4. As mentioned in paragraph 1 'expansion greater than that allowed ...' implies to those unfamiliar with the ISO standards that measurement is required. The authors of this paper believe that it is inappropriate to single out expansion as a criterion, especially since it is not specified whether this is elastic or permanent expansion. Leakage is also a key indicator of the fitness of a pressure receptacle and may occur without permanent expansion particularly in a welded pressure receptacle. Acceptance criteria are not specified for the hydraulic pressure test in Chapter 6.7 (see 6.7.3.15.3 or 6.7.4.14.3 for initial testing of portable tanks for gases) and it is, in our opinion, unnecessary to specify criteria in Chapter 6.2. Technical standards and codes always give instructions on how to conduct and assess a hydraulic test and what are the acceptance criteria. This is evident from the existing words that can only mean that acceptance criteria are in the standard or its equivalent. Furthermore, the acceptance criteria are related to the type of design and the test used, so it is better to leave their specification to the standards or codes.

Proposal 1

5. Replace "design specification" by "design and construction technical standard or technical code" so that 6.2.1.5.1 (g) reads;

> A hydraulic pressure test. Pressure receptacles shall withstand the test pressure without expansion greater than that allowed in the design **and construction technical standard or technical code**.

Proposal 2

6. Replace the words "withstand the test pressure without expansion greater than that allowed in" by "meet the acceptance criteria specified" so that 6.2.1.5.1 (g) reads:

> A hydraulic pressure test. Pressure receptacles shall **meet the acceptance criteria specified** in the design specification.

7. Accepting both proposals results in the following text:

> 6.2.1.5.1 (g) A hydraulic pressure test. Pressure receptacles shall meet the acceptance criteria specified in the design and construction technical standard or technical code.